IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Zhidan Li TOLT	Docket No.	372668-00400 (362842)
Serial No.	10/707,342	Group Art Unit:	2815
Filed:	December 15, 2003	Confirmation No.	1341
For:	LOW VOLTAGE ELECTRON SOURCE WITH SELF ALIGNED GATE APERTURES, AND LUMINOUS DISPLAY USING THE ELECTRO SOURCE	Examiner:	Budd, Paul A.

PETITION FOR EXPUNGEMENT OF INFORMATION OR COPY OF PAPERS IN APPLICATION FILE UNDER 37 CFR § 1.59

Mail Stop Issue Fee
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Applicants hereby petition for expungement of a particular papers in the above-identified application under 37 CFR § 1.59. In support of this petition Applicant submits herewith:

(1) Copy of 9 page document requested for expungement submitted on October 22, 2005 by applicant and titled LETTER AND SUPPLEMENTAL AMENDMENTS;

(2) Authorization for the Director for Patents to charge Deposit Account 50-2778 **(Order No. 372668-00400 (362842))** the amount of petition fee of $200 as set forth in 37 CFR §1.17(g).

This request for the expungement of this particular document is due to an unauthorized communication on October 22, 2005, between the applicant and the examiner, the applicant having granted, on August 8, 2005, a power of attorney to the attorney signing below. Furthermore, the amendment accompanying the document for which expungement is requested was rejected as non-compliant and the issues addressed by the document were addressed in an amendment filed on December 1, 2005, which was entered into the record. Therefore, Applicant's attorney believes the document for

which expungement is requested is not necessary to the understanding of the prosecution of the above-referenced application. Applicant kindly requests grant of this petition.

Respectfully submitted,

Date: February 27, 2008

Anthony B. Diepenbrock III
Attorney for Applicant
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10-25-05

IFW

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Tolt, Z. L.	Docket No.:	nanogate120303
Serial No.:	10/707,342	Group Art Unit:	2815
Filed:	Dec. 5, 2003	Examiner:	Fenty, Jesse

For: LOW VOLTAGE ELECTRON SOURCE WITH SELF ALIGNED GATE APERTURES, FABRICATION METHOD THEREOF, AND LUMINOUS DISPLAY USING THE ELECTRON SOURCE

Box Amendment

Assistant Commissioner for Patents

Washington, D.C. 20231

LETTER AND SUPPLEMENTAL AMENDMENTS

Sir:

Per examiner's request, a letter is submitted to explain the error in claim numbering in the last response to the Office Action submitted on August 26, 2005. A supplemental amendment to the claims is also included.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Tolt, Z. L.	Docket No.:	nanogate120303
Serial No.:	10/707,342	Group Art Unit:	2815
Filed:	Dec. 5, 2003	Examiner:	Fenty, Jesse

For: LOW VOLTAGE ELECTRON SOURCE WITH SELF ALIGNED GATE APERTURES, FABRICATION METHOD THEREOF, AND LUMINOUS DISPLAY USING THE ELECTRON SOURCE

Jesse Fenty, the Examiner
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Date: October 22, 2005

Dear examiner:

Per the conversation between you and my attorney Anthony B. Diepenbrock III, a letter is submitted to explain the error in claim numbering in the last response to the Office Action filed on August 26, 2005.

In the amendment submitted by my attorney, it is stated that all the previous claims 1-33 were cancelled and a new list of claims numbered from 34 to 64 were submitted. The attorney and the applicant made a mistake because there were 37 previous claims instead of 33. Claims 34 to 37 were added to the original list of 33 claims in a preliminary amendment filed on Feb. 5, 2005 by the applicant. The new list should, therefore, start from claim 38 instead of 34. And all the subsequent claims should be number accordingly. During a recent telephone conversation, the examiner had expressed willingness of accepting the numbering of the list as it was submitted on August 26. To avoid any future confusion, it is only to be restated that all the previous claims of 1-37 are cancelled and the applicant wishes to pursue only the list of claims presented in the amendment submitted on August 26, 2005 of claims 34 to 64.

Please note that the applicant has also submitted a supplemental amendment with this letter. Another list of claims is, therefore, presented. In the supplemental amendment, the applicant has adhered to the numbering system adopted by the one submitted on August 26, 2005.

Respectfully,

Zhidan L. Tolt (applicant)
4018 Ellmar Oaks Dr.
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Tel: 408 578 4820

In the claims:

This list of claims will replace all the prior version, and listings, of claims in the application.

LIST OF CLAIMS

34. (currently amended) An emission electron source comprising:

a cathode electrode disposed on a substrate, the cathode electrode for providing a source of electrons;

an emitter layer disposed over said cathode electrode and formed from a composition of an embedding material and one or a plurality of nano-structures embedded therein, the emitter layer having a surface, portions of the nano-structures ~~being truncated parallel to the surface and having portions~~ protruding above the surface to emit electrons;

an insulator disposed over the emitter layer, the insulator having one or a plurality of apertures, each exposing at least the ends of the nano-structures in the emitter layer; and

a gate electrode disposed over the insulator and having one or a plurality of apertures, wherein each aperture exposes a single nano-structure and is concentrically self-aligned with the end of ~~one of~~ the nano-structures~~, so as to expose a single nano-structure and provide the nano-structures with substantially the same emitter-to-gate distance~~, the gate electrode being operative to control the emission of electrons through the apertures from the exposed nano-structures;

wherein the nano-structures have a coating for enhanced field emission performance.

35. (currently amended) An emission electron source comprising:

a cathode electrode disposed on a substrate, the cathode electrode for providing a source of electrons;

an emitter layer disposed over said cathode electrode and formed from a composition of an embedding material and one or a plurality of nano-structures embedded therein, the emitter layer having a surface, portions of the nano-structures ~~being truncated parallel to the surface and having portions~~ protruding above the surface to emit electrons;

an insulator disposed over the emitter layer, the insulator having one or a plurality of apertures, each exposing at least the ends of the nano-structures in the emitter layer; and

a gate electrode disposed over the insulator and having one or a plurality of apertures, wherein each aperture exposes a single nano-structure and is concentrically self-aligned with the end of ~~one of~~ the nano-structures~~, so as to expose a single nano-structure and provide the nano-structures with substantially the same emitter-to-gate distance~~, the gate electrode being operative to control the emission of electrons through the apertures from the exposed nano-structures;

36. (previously presented) An electron source as recited in claim 35, wherein said nano-structures are substantially vertical.

37. (previously presented) An electron source as recited in claim 35, wherein said nano-structures are individually spaced apart.

38. (previously presented) An electron source as recited in claim 35, wherein said emitter-to-gate distance for each nano-structure is substantially less than one micrometer.

39. (previously presented) An electron source as recited in claim 35, wherein the nano-structures have a surface density substantially higher than $10^6/cm^2$.

40. (previously presented) An electron source as recited in claim 35, wherein the nano-structures protrude above the surface of the emitting layer for not more than half of one micrometer.

41. (previously presented) An electron source as recited in claim 35, wherein the apertures in the insulator expose the entire protrusion portion of the nano-structures in the emitting layer.

42. (previously presented) An electron source as recited in claim 35, wherein the nano-structures have at least one of their three dimensions in the nanometer range.

43. (previously presented) An electron source as recited in claim 35, wherein the nano-structures include nano-tubes, nano-wires, nano-fibers, and nano-cones.

44. (previously presented) An electron source as recited in claim 35, wherein the nano-structures have a coating for enhanced field emission performance.

45. (previously presented) An electron source as recited in claim 35, wherein the nano-structures are selected from a group of materials consisting of carbon, refractory metals and alloys, conductive ceramics, conductive ceramic composites, and doped semiconductors.

46. (previously presented) An electron source as recited in claim 45, wherein the carbon includes carbon nano-tube, carbon nano-fiber, and carbon nano-cone.

47. (previously presented) An electron source as recited in claim 35, wherein the nano-structures comprise a nonconductive core and a conductive shell.

48. (previously presented) An electron source as recited in claim 47, wherein the nonconductive core is made from one of wide band gap semiconductors, including diamond, BN, AlN, AlGaN, GaN, GaAs, SiC, and ZnO.

49. (previously presented) An electron source as recited in claim 35, wherein the embedding material is comprised of at least two layers.

50. (previously presented) An electron source as recited in claim 49, wherein the first layer of the embedding material is conductive.

51. (previously presented) An electron source as recited in claim 35, wherein the insulator and the embedding material are composed of the same dielectric material.

52. (previously presented) An electron source as recited in claim 35, wherein said insulator functions also as the embedding material.

53. (previously presented) An electron source as recited in claim 35,

wherein the cathode electrode is configured as a plurality of electrically isolated cathode electrodes, each for supplying an independent source of electrons;

wherein the gate electrode is configured as a plurality of electrically isolated electrodes, each intersecting with said cathode electrodes and having one or a plurality of apertures at each intersections, each gate electrode being operative to control the emission of electrons through the apertures along the gate electrode; and

wherein activation of a selected cathode and a selected gate electrode determines an intersection where the nano-structures emit electrons.

54. (previously presented) An electron source comprising:

a substrate;

electrode means, disposed over the substrate, for providing a source of electrons;

means, disposed over the source means, for emitting electrons provided by the source means, the emitting means including a one or a plurality of nano-structure emitting means for providing a flow of electrons and means for supporting the nano-structure emitting means;

an insulator disposed over the emitting means; and

one or a plurality of gating means, disposed over the insulator, for controlling the flow of electrons emitted by the nano-structure emitting means, each of said gating means arranged symmetrically relative to one of the nano-structure emitting means.

55. (previously presented) An electron source as recited in claim 54, wherein the insulator and the gating means each include one or more apertures that expose the nano-structure emitting means.

56. (previously presented) An electron source as recited in claim 54, wherein the nano-structure emitting means has at least one of its three dimensions in the nanometer range.

57. (Previously presented) An electron source as recited in claim 54, wherein the nano-structure emitting means includes carbon nano-tube, carbon nano-fiber, and carbon nano-cones.

58. (Previously presented) An electron source as recited in claim 54, wherein the nano-structure emitting means is substantially vertical.

59. (Previously presented) An electron source as recited in claim 54, wherein the nano-structure emitting means is an array of individually spaced apart nano-structures.

60. (currently amended) A display comprising:

an electron source that includes:

a cathode electrode disposed on a substrate, the cathode electrode for providing a source of electrons;

an emitter layer disposed over said cathode electrode and formed from a composition of an embedding material and one or a plurality of nano-structures embedded therein, the emitter layer having a surface, portions of the nano-structures ~~being truncated parallel to the surface and having portions~~ protruding above the surface to emit electrons;

an insulator disposed over the emitter layer, the insulator having one or a plurality of apertures, each exposing at least the ends of the nano-structures in the emitter layer; and

a gate electrode disposed over the insulator and having one or a plurality of apertures, wherein each aperture exposes a single nano-structure and is concentrically self-aligned with the end of ~~one of~~ the nano-structures~~, so as to expose a single nano-structure and provide the nano-structures with substantially the same emitter-to-gate distance~~, the gate electrode being operative to control the emission of electrons through the apertures from the exposed nano-structures; and

an anode plate including a transparent anode electrode disposed over a glass substrate and a phosphor screen disposed over the anode electrode, the anode plate being positioned opposite to said electron source with a vacuum gap disposed therebetween;

wherein electrons are emitted from said nano-structures by applying a voltage between said cathode and gate electrodes, and are made incident on said phosphor screen to make luminous said phosphor screen.

61. (Previously presented) A display as recited in claim 60, wherein the nano-structures are substantially vertical.

62. (Previously presented) A display as recited in claim 60, wherein the emitter-to-gate distance for each emitter is substantially less than one micrometer.

63. (Previously presented) A display as recited in claim 60, wherein the nano-structures have a surface density substantially higher than $10^6/cm^2$.

64. (Previously presented) A display as recited in claim 60,

wherein the cathode electrode is configured as a plurality of strip-like cathode electrodes extending substantially in the same direction in such a manner as to be spaced from each other at intervals in the transverse direction, each cathode strip for providing an independent source of electrons;

wherein the gate electrode is configured as a plurality of strip-like gate electrodes extending in such a manner as to intersect said plurality of cathode electrodes and to be spaced from each other at intervals in the transverse direction, and having one or a plurality of apertures at each intersection, each gate electrode for controlling the emission of electrons through the apertures along the gate electrode; and

wherein the anode electrode is configured as a plurality of strip-like anode electrodes each extending in such a manner as to be opposed to the corresponding one of said gate electrodes.

65. (new) An electron source as recited in claim 35,

wherein said nano-structures in the emitter layer are truncated to substantially the same length, so that each exposed nano-structure in the gate aperture has substantially the same gate-to-emitter distance.

66. (new) An electron source as recited in claim 65, wherein said nano-structures are truncated by chemical mechanical planarization.

67. (new) An electron source as recited in claim 35,

wherein said nano-structures are grown using a template, and said template is at least part of the embedding material.

68. (new) An electron source as recited in claim 54, wherein said supporting means is provided by embedding portion of the nano-structure emitting means.

69. (new) An electron source as recited in claim 55, wherein said nano-structure emitting means each has substantially the same distance to the gating means.

70. (new) An electron source as recited in claim 59, wherein said nano-structures are truncated to substantially the same length.

71. (new) An display as recited in claim 60,

wherein said nano-structures in the emitter layer are truncated to substantially the same length, so that each exposed nano-structure in the gate aperture has substantially the same gate-to-emitter distance.

CONCLUSION

The supplemental amendment is summarized as the following:

Claims 34, 35, 60 are amended.

Claims 36-59, and 61- 64 are previously presented.

Claims 65 - 71 are newly added.

Date: October 22, 2005

Respectfully submitted

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